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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,997	10/31/2003	Jae-Cheol Lee	P-0588	8241

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EXAMINER	
LEE, SIU M	
ART UNIT	**PAPER NUMBER**
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/696,997	LEE, JAE-CHEOL	
	Examiner	Art Unit	
	Siu M. Lee	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 21-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12-20* is/are allowed.

6)☒ Claim(s) *1-5,8-10 and 21-30* is/are rejected.

7)☒ Claim(s) *6,7 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/8/2005.*, 12/7/2005, 3/29/2004
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4, 5, 8-10, 21, 22, 24-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 7,130,360 B2) in view of Van Der Wal et al. (US 2005/0053048 A1).

(1) Regarding claim 1:

Lee et al. discloses a synchronization searching method comprising selecting a region (a time selector 40 in figure 1 selecting an optimal symbol synchronization point, paragraph 0037, lines 11-13) for an initial synchronization from an input signal.

Lee et al. fails to explicit disclose obtaining a synchronization by correlating the selected region and a synchronous code.

However, Van Der Wal et al. discloses obtaining a synchronization by correlating the selected region and a synchronous code (after the time information associated with the CDMA system from the signal portion, this allow to start the synchronization step, in which a code match is searched (e.g. using match filter), paragraph 0004, lines 7-12).

It is desirable to obtaining a synchronization by correlating the selected region and a synchronous code because this allows to start up the mobile equipment in the

TDD-CDMA system in a more efficient and less time consuming way (paragraph 0009, lines 3-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the teaching of Van Der Wal et al. with the method of Lee et al. to improve the efficiency of the method.

(2) Regarding claim 2:

Lee et al. further discloses wherein the region selecting comprises respectively accumulating input signals of a channel I and a channel Q (the sample arranger 21 in figure 1 classifying the over-sampled incoming signal into a sub-sample group, paragraph 0044, lines 1-4) and obtaining absolute values for each (the absolute value calculator 23 in figure 1 converting the subsample values output by the sample arranger 21 into absolute values, paragraph 0044, lines 5-6); adding the two absolute values (the integrator 30 in figure 1 integrated the output of the signal processor 20 in figure 1, paragraph 0037, lines 8-9).

Lee et al. fails to explicitly disclose estimating a region showing a high power distribution in a power distribution of the added absolute value as a candidate region.

However, Van Der Wal et al. discloses estimating a region showing a high power distribution in a power distribution of the added absolute value as a candidate region (the signal portion being scanned for in the radio signal is the received power of the base station signal as received by the mobile equipment such as the received signal strength indicator (RSSI), paragraph 0005, lines 1-4).

It is desirable to estimating a region showing a high power distribution in a power distribution of the added absolute value as a candidate region because it provide a

more efficient synchronization of the mobile equipment, paragraph 0003). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the teaching of Van Der Wal et al. with the method of Lee et al. to improve the efficiency of the synchronization method.

(3) Regarding claim 4:

Van Der Wal et al. further discloses wherein the candidate region estimating comprises:

searching the region with the high power distribution from the absolute value of the input signal (the signal portion being scanned for in the radio signal is the received power of the base station as received by the mobile equipment such as the received signal strength indicator (RSSI), paragraph 0005, lines 1-4) ;

checking whether a length of the region corresponds to a search range (these peaks have certain characteristics, duration of 256 chips which make these peaks easy to detect, paragraph 0027, lines 10-12); and

estimating the region as a candidate region if the length of the region with the high power distribution corresponds to the search range (once these peaks are detected, the mobile station 12 in figure 1 is aware of the timing of the synchronization channel, paragraph 0027, lines 15-17).

It is desirable to searching the region with the high power distribution from the absolute value of the input signal; checking whether a length of the region corresponds to a search range; and estimating the region as a candidate region if the length of the region with the high power distribution corresponds to the search range because it

provides a more efficient synchronization of the mobile equipment, paragraph 0003). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the method of Van Der Wal et al. in the method of Lee et al. to improve the efficiency of the synchronization method.

(4) Regarding claim 5:

Although Lee et al. in view of Van Der Wal et al. do not specifically disclose wherein the search range is 64 bits, such limitation are merely a matter of design choice and would have been obvious in the method of Van Der Wal et al.. Van Der Wal et al. teaches the search range of 256 chips (these peaks have certain characteristics (duration of 256 chips), paragraph 0027, lines 10-11). The limitation in claim 5 do not define a patentably distinct invention over Lee et al. since both invention as a whole and Van Der Wal et al. are directed to search for a power peak of a define range. Therefore, the search for a search range of 64 chips would have been a matter of obvious design choice to one of ordinary skill in the art.

(5) Regarding claim 8:

Lee et al. discloses an method comprising accumulating signals I and Q and obtaining an absolute values for each signal (sampler arranger 21 in figure 1 accumulate the incoming signal and calculate the absolute value of the signal by the absolute value calculator 23, paragraph 0046, lines 3-4, paragraph 0044, lines 5-7); combining the two absolute values (paragraph 0048, lines 1-2).

Lee et al. fails to disclose a method of estimating a candidate region from a power distribution of the added absolute values and correlating the estimated candidate region with a synchronous code to obtain initial synchronization of a terminal.

However, Van Der Wal et al. disclose a method of estimating a candidate region from a power distribution of the added absolute values (the signal portion being scanned for in the radio signal is the received power of the base station signal as received by the mobile equipment such as the received signal strength indicator (RSSI), paragraph 0005, lines 1-4) and correlating the estimated candidate region with a synchronous code to obtain initial synchronization of a terminal (starting the synchronization step in which a code match is searched (using match filter) on a very efficient time in the frame, paragraph 0004, lines 9-13).

It is desirable to estimate a candidate region from a power distribution of the added absolute values and correlating the estimated candidate region with a synchronous code to obtain initial synchronization of a terminal because this allows to start up the mobile equipment in the TDD-CDMA system in a more efficient and less time consuming way (paragraph 0009, lines 3-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the teaching of Van Der Wal et al. with the method of Lee et al. to improve the efficiency of the method.

(6) Regarding claim 9:

Van Der Wal et al. further discloses wherein the candidate region estimating comprises:

searching the region with the high power distribution from the absolute value of the input signal (the signal portion being scanned for in the radio signal is the received power of the base station as received by the mobile equipment such as the received signal strength indicator (RSSI), paragraph 0005, lines 1-4) ;

checking whether a length of the region corresponds to a search range (these peaks have certain characteristics, duration of 256 chips which make these peaks easy to detect, paragraph 0027, lines 10-12); and

estimating the region as a candidate region if the length of the region with the high power distribution corresponds to the search range (once these peaks are detected, the mobile station 12 in figure 1 is aware of the timing of the synchronization channel, paragraph 0027, lines 15-17).

It is desirable to searching the region with the high power distribution from the absolute value of the input signal; checking whether a length of the region corresponds to a search range; and estimating the region as a candidate region if the length of the region with the high power distribution corresponds to the search range because it provides a more efficient synchronization of the mobile equipment, paragraph 0003). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the method of Van Der Wal et al. in the method of Lee et al. to improve the efficiency of the synchronization method.

(7) Regarding claim 10:

Although Lee et al. in view of Van Der Wal et al. do not specifically disclose wherein the search range is 64 bits, such limitation are merely a matter of design choice

and would have been obvious in the method of Van Der Wal et al.. Van Der Wal et al. teaches the search range of 256 chips (these peaks have certain characteristics (duration of 256 chips), paragraph 0027, lines 10-11). The limitation in claim 10 do not define a patentably distinct invention over Lee et al. since both invention as a whole and Van Der Wal et al. are directed to search for a power peak of a define range. Therefore, the search for a search range of 64 chips would have been a matter of obvious design choice to one of ordinary skill in the art.

(8) Regarding claim 21:

Lee et al. discloses an apparatus comprising an estimator (time selector 40 in figure 1) configured to select a region from an input signal, wherein the input signal comprises combined value of I and Q signals (time selector 40 in figure 1 selects a optimal symbol synchronization point from among values output from the integrated and processed received signal, paragraph 0052).

Lee et al. fails to disclose a synchronization configured to determine an initial synchronization from the region by correlating the selected region to a synchronization code.

However, Van Der Wal et al. discloses a synchronization configured to determine an initial synchronization from the region by correlating the selected region to a synchronization code (starting the synchronization step in which a code match is searched (using match filter) on a very efficient time in the frame, paragraph 0004, lines 9-13).

It is desirable to obtaining a synchronization by correlating the selected region and a synchronous code because this allows to start up the mobile equipment in the TDD-CDMA system in a more efficient and less time consuming way (paragraph 0009, lines 3-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the teaching of Van Der Wal et al. with the method of Lee et al. to improve the efficiency of the method.

(9) Regarding claim 22:

Lee et al. discloses the apparatus further comprising: accumulation buffers (sample arranger 21 in figure 1) and absolute value calculators (absolute value calculator 23 in figure 1) configured to receive the I and Q signals (analog signal in figure 1) and to generate absolute values for each signal (paragraph 0044); and an adder (integrator 30 in figure 1) configured to add the absolute values of the I and Q signal to generate the combined value of the I and Q signals and to convey the combined value to the estimator (time selector 40 in figure 1) (time selector 40 selects an optimal symbol synchronization point from among values output by the integrator 30, paragraph 0048 and paragraph 0052).

(10) Regarding claim 24:

Lee et al. further discloses wherein the accumulation buffers are configured to accumulate a plurality of oversampled I and Q signals, respectively (the sample arranger 21 for classifying the oversampled signal output by the analog/digital converter 10 into a subsample group, paragraph 0044, lines 1-3).

(11) Regarding claim 25:

Lee et al. fails to discloses wherein the estimator is configured to select the region by searching the input signal and selecting a region that has a relatively high power distribution in comparison to the remaining input signal.

However, Van Der Wal et al. discloses wherein the estimator is configured to select the region by searching the input signal and selecting a region that has a relatively high power distribution in comparison to the remaining input signal (the signal portion being scanned for in the radio signal be the received power of the base station signal as received by the mobile equipment such as the received signal strength indicator (RSSI), paragraph 0005, lines 1-4).

It is desirable to for the estimator configured to select the region by searching the input signal and selecting a region that has a relatively high power distribution in comparison to the remaining input signal because it slows a more efficient synchronization of the mobile equipment (paragraph 0003). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Van Der Wal et al. in the apparatus of Lee et al. to improve the efficiency in the synchronization of the mobile equipment.

(12) Regarding claim 26:

Lee et al fails to disclose wherein the estimator is configured to select the region by comparing the length of the region to a search range.

Van Der Wal et al. further discloses wherein the estimator is configured to select the region by comparing the length of the region to a search range (the received power

or RSSI peaks having a time period of less than a predetermined number of chips; e.g. 300, paragraph 0005, lines 7-9).

It is desirable for the estimator configured to select the region by comparing the length of the region to a search range because this allows to start up the mobile equipment system in a more efficient and less consuming way (paragraph 0009, lines 3-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Van Der Wal et al. in the apparatus of Lee et al. to improve the speed in the start up process of the mobile station.

(13) Regarding claim 27:

Although Lee et al. in view of Van Der Wal et al. do not specifically disclose wherein the search range is 64 bits, such limitation are merely a matter of design choice and would have been obvious in the method of Van Der Wal et al.. Van Der Wal et al. teaches the search range of 256 chips (these peaks have certain characteristics (duration of 256 chips), paragraph 0027, lines 10-11). The limitation in claim 27 do not define a patentably distinct invention over Lee et al. since both invention as a whole and Van Der Wal et al. are directed to search for a power peak of a define range. Therefore, the search for a search range of 64 chips would have been a matter of obvious design choice to one of ordinary skill in the art.

(14) Regarding claim 28:

Van Der Wal et al. further disclose that wherein the apparatus is at least one of a base station and a mobile terminal (mobile station 12 (MS1-MSN) and base station 11 in figure 1, paragraph 0019, lines 1-5).

(15) Regarding claim 29:

Van Der Wal et al. further discloses wherein the apparatus is a mobile communication system (TDD-CDMA system 10 in figure 1 for mobile communication, paragraph 0019, lines 1-2).

(16) Regarding claim 30:

Van Der Wal et al. further discloses that the mobile communication system is at least one of a Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) communication system and a Universal Mobile Telecommunications System-Time division Duplexing (UMTS-TDD) communication system (paragraph 0010).

It is desirable to for the mobile communication system is at least one of a Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) communication system and a Universal Mobile Telecommunications System-Time division Duplexing because it allows to start up the mobile equipment in the TDD-CDMA system in a more efficient and less time consuming way (paragraph 0009, lines 3-5). There, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Van Der Wal et al. in the apparatus of Lee et al. to improve the speed of synchronization of the apparatus.

3. Claims 3 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 7130360 B2) in view of Van Der Wal et al. (US 2005/0053048 A1) as applied to claim 2 above, and further in view of Thomson (US 5,442,579).

(1) Regarding claim 3:

Lee et al. in view of Van Der Wal et al. disclose all the subject matter as discussed in claim 2 except wherein accumulating is performed by a circulation buffer.

However, Thomson discloses using a circular buffer as an accumulation buffer (figure 6A, column 5, lines 34-35).

It is desirable to using a circular buffer as an accumulation buffer because it can improve the efficiency of the system (column 2, lines 64-66). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Thomson in the system of Lee et al. and Van Der Wal et al. to improve the efficiency of the system.

(2) Regarding claim 23:

Lee et al. in view of Van Der Wal et al. fails to disclose wherein the accumulation buffers are circular buffers.

However, Thomson discloses using a circular buffer as an accumulation buffer (figure 6A, column 5, lines 34-35).

It is desirable to using a circular buffer as an accumulation buffer because it can improve the efficiency of the system (column 2, lines 64-66). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Thomson in the system of Lee et al. and Van Der Wal et al. to improve the efficiency of the system.

Allowable Subject Matter

4. Claims 6, 7 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. Claims 12-20 allowed.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Li et al. (US 6,778,588 B2) discloses a method for cell search in a CDMA mobile communication system. Mill (US 2002/0075974 A1) discloses detecting preambles of data packets. Du Reau et al. (US 6,717,996 B1) discloses a digital signal timing synchronization process.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Siu M. Lee whose telephone number is (571) 270-1083. The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Siu M. Lee
2/12/2007

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER